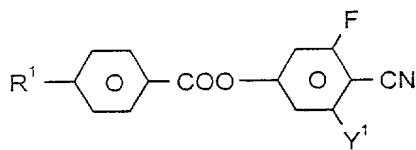


**Patent Claims**

1. An electro-optical liquid-crystal display comprising  
5 a layer of liquid-crystal medium between two substrates with  
alignment layers on inside surfaces of each of said substrates;  
the liquid-crystal layer having a twist angle, from one substrate to the  
other, of 110°-360°;  
10 the liquid-crystal layer having a surface tilt angle of 2°-20°; and  
each of said alignment layers having a thickness of 3 nm-150 nm.
- 15 2. A display according to claim 1, at least one of said alignment layers  
has a layer thickness of 4 nm-60 nm.
- 20 3. A display according to claim 2, wherein the difference from 1 of the  
steepness of the electric-optical characteristic line, represented by  
the formula  $V_{90}/V_{10}-1$ , is half or less of the corresponding value of an  
otherwise identical display in which the layer thicknesses of each of  
the alignment layers is 100 nm.
- 25 4. A display according to claim 1, wherein the steepness of the electro-  
optical characteristic line  $V_{90}/V_{10}$  is 1.06 or less.
- 30 5. A display according to claim 1, wherein the threshold voltage ( $V_{10}$ ) of  
the display is 1.20 V or less.
- 35 6. A display according to claim 1, wherein said liquid-crystal medium  
comprises one or more compound(s) of formula I

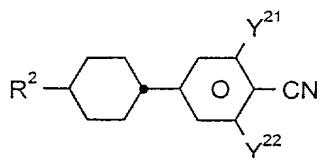


wherein

5             $R^1$         is alkyl having 1 to 7 carbon atoms, alkoxy having 1 to 7 carbon atoms, alkoxyalkyl having 2 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms or alkenyloxy having 2 to 7 carbon atoms, and

10             $Y^1$         is H or F.

15            7. A display according to claim 1, wherein said liquid crystal medium comprises at least one compound of formula II



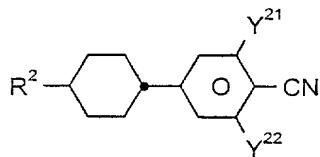
II

wherein

20             $R^2$         is alkyl having 1 to 7 carbon atoms, alkoxy having 1 to 7 carbon atoms, alkoxyalkyl having 2 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms or alkenyloxy having 2 to 7 carbon atoms, and

25             $Y^{21}$  and  $Y^{22}$  are each, independently, H or F.

30            8. A display according to claim 6, wherein said liquid crystal medium comprises at least one compound of formula II



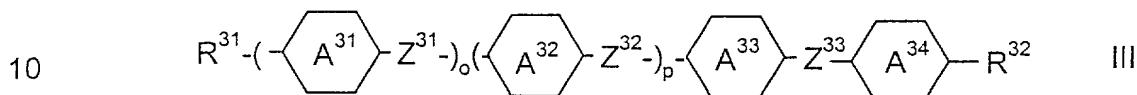
II

wherein

$R^2$  is alkyl having 1 to 7 carbon atoms, alkoxy having 1 to 7 carbon atoms, alkoxyalkyl having 2 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms or alkenyloxy having 2 to 7 carbon atoms, and

5  $Y^{21}$  and  $Y^{22}$  are each, independently, H or F.

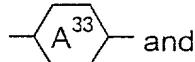
9. A display according to claim 6, wherein said liquid crystal medium comprises at least one compound of formula III



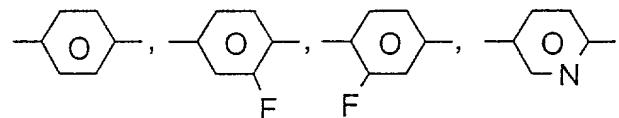
wherein

15  $R^{31}$  and  $R^{32}$  are each, independently of one another, alkyl having 1 to 7 carbon atoms, alkoxy having 1 to 7 carbon atoms, alkoxyalkyl, having 2 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms, or alkenyloxy having 2 to 7 carbon atoms, and

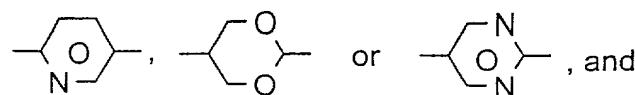
20  $Z^{31}$ ,  $Z^{32}$  and  $Z^{33}$  are each, independently of one another,  $-CH_2CH_2-$ ,  $-CH=CH-$ ,  $-COO-$  or a single bond,



30 are each, independently of one another,



5

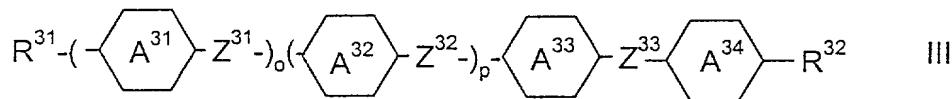


o and p, independently of one another, are 0 or 1.

10

10. A display according to claim 7, wherein said liquid crystal medium comprises at least one compound of formula III

15



wherein

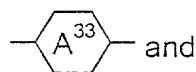
20

$R^{31}$  and  $R^{32}$  are each, independently of one another, alkyl having 1 to 7 carbon atoms, alkoxy having 1 to 7 carbon atoms, alkoxyalkyl, having 2 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms, or alkenyloxy having 2 to 7 carbon atoms, and

25

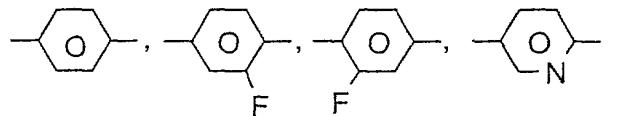
$Z^{31}$ ,  $Z^{32}$  and  $Z^{33}$  are each, independently of one another,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}=\text{CH}-$ ,  $-\text{COO}-$  or a single bond,

30

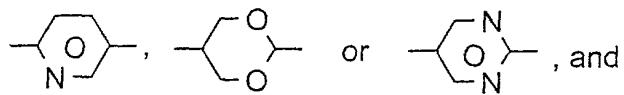


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—— are each, independently of one another, ——,



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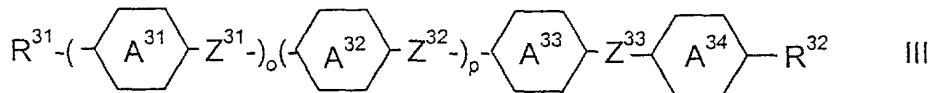


o and p, independently of one another, are 0 or 1.

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11. A display according to claim 8, wherein said liquid crystal medium comprises at least one compound of formula III

15



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wherein

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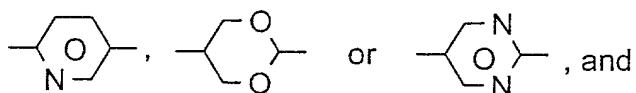
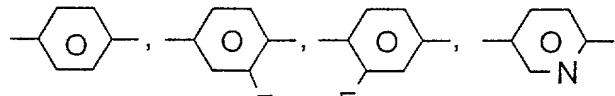
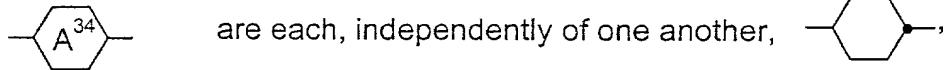
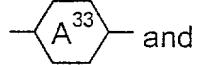
$R^{31}$  and  $R^{32}$  are each, independently of one another, alkyl having 1 to 7 carbon atoms, alkoxy having 1 to 7 carbon atoms, alkoxyalkyl, having 2 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms, or alkenyloxy having 2 to 7 carbon atoms, and

25

$Z^{31}$ ,  $Z^{32}$  and  $Z^{33}$  are each, independently of one another,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}=\text{CH}-$ ,  $-\text{COO}-$  or a single bond,

30

35



20      o and p, independently of one another, are 0 or 1.

25      12. In a method of displaying information using an electro-optical liquid-crystal display, the improvement wherein said display is one in accordance with claim 1.

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